A new class of maximal hyperelliptic curves

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Abstract - A (smooth, complete, absolutely irreducible) curve C defined over a finite field k is called maximal if its number of k-rational points reaches the Hasse-Weil bound: $\#C(k) = 1 + \#k + 2*\text{genus}(C)*\sqrt{\#k}$.

Combining classical results on permutation polynomials with work of Shimura and Taniyama on slopes of Frobenius for CM abelian varieties and finally, 2-descent methods, we obtain infinitely many new examples of maximal hyperelliptic curves.

This is joint work with Saeed Tafazolian (Univ. of Campinas, Brazil).